

## PART VIII – FENCING

### ITEM F-160 WIRE FENCE WITH WOOD POSTS (Classes A and B Fences)

#### DESCRIPTION

**160-1.1** This item covers the requirements for furnishing materials and constructing new wire fences and gates with wood posts in accordance with the details included herein and as shown on the plans. The class of fence to be erected shall be either Class A, woven wire fencing surmounted by two strands of barbed wire, or Class B, four strands of barbed wire, as indicated on the plans and in the bid proposal.

#### MATERIALS

##### 160-2 WIRE.

**a. Woven Wire (Zinc-coated).** The woven wire fence shall be 7-bar, 26-inch (66 cm) field fence with top and bottom wires No. 10 ASW gauge, and filler and stay wires No. 12 1/2 ASW gauge. Stay wires shall be spaced 6 inches (150 mm) apart. All wires shall be smooth galvanized steel wire, conforming to *ASTM A 121*, Type B. All wires shall be two-dip and shall be spaced as shown on the plans.

**b. Barbed Wire (Zinc-coated).** Zinc-coated barbed wire shall be 2-strand twisted No. 12 1/2 ASW gauge galvanized steel wire with 4-point barbs of No. 14 ASW gauge galvanized steel wire. All wire shall conform to *ASTM A 121*, Type A. The barbs shall be spaced approximately 4 inches (100 mm) apart.

**c. Barbed Wire (Copper-covered).** Copper-covered steel barbed wire shall conform to *ASTM A 121*, Type A.

**d. Barbed Wire (Aluminum-coated).** Aluminum-coated steel-barbed wire shall be 2-strand twisted No. 12 1/2 ASW gauge. The 4-point barbs of No. 14 ASW gauge aluminum-coated steel wire shall be spaced approximately 5 inches (125 mm) apart. The steel wire shall have a tensile strength of between 60,000 and 80,000 pounds per square inch (413 400 and 551 200 kPa), and the aluminum coating shall have a minimum weight of 0.30 ounce per square foot (0.07 kg/square meter) of wire surface on the No. 12 1/2 ASW gauge line wires and 0.25 ounce per square foot (0.06 kg/square meter) of wire surface on the No. 14 ASW gauge barbs.

**e. Bracing Wire (Zinc-coated).** Wire used for cable for bracing shall be No. 9 smooth galvanized soft wire.

**160-2.2 GATES AND HARDWARE.** Gates shall be constructed of galvanized steel tubing conforming to Fed. Spec. RR-F-191 and shall be the size shown on the plans. Heavily galvanized hinges and latches for wood posts shall be furnished with each gate. Either a bolt or lag screw hinge shall be used, and either a wing or butterfly latch shall be furnished.

##### 160-2.3 POSTS.

**a. Species.** All posts shall be one of the following species of wood, unless otherwise noted in the proposal.

Group I	Group II
Cedar	Douglas-fir
Chestnut	Gum, Red
Cypress, Southern	Larch, Western

Locust, Black	Pine, Southern Yellow
Osage-orange	Pine, Lodgepole
Redwood	Tamarack
Yew, Pacific	Ash
Honeylocust	Maple, Sugar
Oak, White	Oak, Red
Mulberry	Spruce
Live Oak	

Posts of Group I may be used untreated, provided at least 75% of the wood is heartwood. Posts of less than 75% heartwood of Group I shall be given a preservative treatment for the part of the post that will have contact with the ground line in accordance with the method specified under subparagraph e(1) below. Posts of Group II shall be given a preservative treatment in accordance with the method specified under subparagraph e(2) below.

**b. Quality.** Posts shall be peeled, sound, straight-grained, free from decay, cracks, and splits; shakes shall not be in excess of 1/4 inch (6 mm) wide and 3 feet (90 cm) long. Checks (lengthwise separations of the wood in a generally radial direction) are permitted, provided they are not injurious.

**c. Dimensions.** All posts shall be of the length shown on the plans. Posts shall have the minimum top diameters shown on the plans or as specified. Sawed and split posts are acceptable in lieu of round posts provided their dimensions are such that round posts of required diameter could be turned therefrom.

**d. Manufacture.** Outer bark shall be completely removed from all posts including depressions. Inner bark shall be removed from all post surfaces to be treated, except inner bark may remain in depressions. The amount of wood shaved off in the removal of inner bark shall be held to a minimum.

**e. Treatment.**

**(1) Butt treatment.** All timber shall be thoroughly seasoned and dry (22% maximum moisture content) before applying preservative treatment. The treatment shall be by a process at least equal to a hot and cold bath process. The hot bath temperature shall be from 200 to 230 F (90 to 110 C) for a duration of 45 minutes, and the cold bath temperature not over 120 F (50 C) for a duration of 45 minutes. The preservative shall be either coal-gas tar or coke-oven tar creosote conforming to American Wood Preservers Association (AWPA) Specification No. 4 for Grade 1 creosote; or a 5% minimum, by weight, pentachlorophenol petroleum solution made by either mixing a liquid concentrate of pentachlorophenol in fuel oil or kerosene, or by dissolving pentachlorophenol crystals of technical purity in suitable fuel oil solvents, as specified by AWPA.

**(2) Full length treatment.** Posts shall be conditioned by air seasoning, steaming, or heating in oil in a manner that prevents injurious checking, splitting, or warping before treating. The treatment, care and preservative shall be in accordance with [AWPA](#).

**160-2.4 BRACES.** Cleats, gate stops, and braces shall be of the size shown on the plans. They shall be of the same species and quality specified for the posts or approved by the Engineer, and they shall be free from knots larger than one-third the width of the piece. Gate stops shall be made of posts of suitable length. Braces may be made of posts of suitable length or of sawed lumber. All cleats, gate stops, and any braces in contact with the ground and for a distance of at least 6 inches (150 mm) above the ground shall be treated by the hot and cold bath process, specified herein for posts. The wire used in cable for bracing shall conform to 160-2.1e.

**160-2.5 STAPLES.** The staples shall be No. 9 galvanized steel wire, 1 inch (25 mm) long for hardwood posts and 1-1/2 inches (37 mm) long for use in softwood posts.

## CONSTRUCTION METHODS

**160-3.1 GENERAL.** The fence shall be constructed in accordance with the details on the plans and as specified herein using new materials, and all work shall be performed in a workmanlike manner, satisfactory to the Engineer. Prior to the beginning of the work or upon the request of the Contractor, the Engineer shall locate the position of the work by establishing and marking the property line or fence line. When directed, the Contractor shall span the opening below the fence with barbed wire fastened to posts of extra length at locations of small natural or drainage ditches where it is not practical to conform the fence to the general contour of the ground surface. The new fence shall be permanently tied to the terminals of existing fences whenever required by the Engineer. The finished fence shall be plumb, taut, true to line and ground contour, and complete in every detail. When directed, the Contractor shall stake down the woven wire fence at several points between posts.

When directed, in order to keep stock on adjoining property enclosed at all times, the Contractor shall arrange the work so that construction of the new fence will immediately follow the removal of existing fences. The length of unfenced section at any time shall not exceed 300 feet (90 m) or such length that the stock can be kept in the proper field. The work shall progress in this manner, and at the close of the working day, the newly constructed fence shall be tied to the unremoved existing fence. Any openings in the fence shall be guarded when stock is using the adjoining property.

**160-3.2 CLEARING FENCE LINE.** The site of the fence shall be sufficiently clear of obstructions, and surface irregularities shall be graded so that the fence will conform to the general contour of the ground. The fence line shall be cleared to a minimum width of 2 feet (60 cm) on each side of the centerline of the fence. This clearing shall consist of the removal of all stumps, brush, rocks, trees, or other obstructions which will interfere with proper construction of the fence. Stumps within the cleared area of the fence line shall be grubbed or excavated. The bottom of the fence shall be placed a uniform distance above ground as specified in the plans. When shown on the plans or as directed by the Engineer, the existing fences which coincide with, or are in a position to interfere with, the new fence location shall be removed by the Contractor as part of the construction work, unless such removal is listed as a separate item in the bid schedule. All holes remaining after post and stump removal shall be refilled with suitable soil, gravel, or other material acceptable to the Engineer and shall be compacted properly with tampers.

The work shall include the handling and disposal of all material cleared, of excess excavation and the removal of spoiled material regardless of the type, character, composition, or condition of such material encountered.

**160-3.3 SETTING POSTS.** Posts shall be set with large ends down, plumb, and in good line on the side on which the wire is to be fastened. Posts shall be set full depth and shall not be cut off to eliminate rock or other excavation. Where rock is encountered, it shall be removed, even if blasting is necessary, to provide full-depth and full-size holes. The bottoms of all posts shall be cut off square. The diameter of the holes shall be at least 6 inches (150 mm) larger than the diameter of the posts. When cleats are used on posts, the holes shall be dug large enough to accommodate them. After posts are placed and lined, the holes shall be backfilled with suitable material which shall be properly compacted by the use of tampers. The posts adjacent to end, corner, anchor, and gate posts shall be set and braced with braces and wire, as shown on the plans. No extra compensation shall be made for rock excavation. Rock excavation shall not be grounds for extension of time.

**160-3.4 ANCHORING.** Corner, end, gate, and adjacent intermediate posts shall be anchored, by gaining and spiking cleats to the sides of the posts, as indicated on the plans. No cleats will be required on other intermediate posts or on anchor posts.

**160-3.5 BRACING.** End, corner, anchor, and gate posts shall be braced by using a post of sufficient length or a piece of sawed lumber of the proper size, together with a wire cable. The wooden brace shall be gained and securely spiked into the end, corner, anchor, or gate posts and into the next intermediate posts about 6 inches (150 mm) from the top of the respective posts. A cable made of a double strand of galvanized soft wire shall be looped around the end, corner, anchor, or gate post near the ground and around the next intermediate post about 12 inches (300 mm) from the top. After the cable has been stapled in this position, it shall be twisted until tight. The staples used to hold the cable shall be not less than 1-1/2 inches (37 mm) long. The tool used for twisting the cable shall be left in place to permit later adjustment of bracing if found necessary. Anchor posts shall be set at approximately 500-foot (150 m) intervals and braced to the adjacent posts. Posts shall be braced before the wire fencing is placed.

**160-3.6 INSTALLING WIRE.** The wires shall be placed on the side of the posts away from the airport or as directed. The wire fence shall be placed on the posts at the height indicated on the plans. Longitudinal wires shall be installed parallel and drawn uniformly taut. The vertical stay wires of the woven wire fencing shall be straight and vertical. At end and gate posts the woven wire and barbed wire shall be wrapped once around the post; each longitudinal wire shall be stapled at least three times and the ends of these wires shall be tied with a snug, tight twist. Each longitudinal wire shall be stapled to each intermediate post with one steel wire staple; at the corner and anchor posts, two or more stapled shall be used. The top strand of barbed wire of all fences shall be stapled with two staples in each post. All staples shall be set diagonally with the grain of the wood and driven up tight. After the fence has been erected, the tops of the wood posts shall be sawed off with a 1-to-3 pitch. The bottom wire of the wire fencing shall clear the ground by not more than 4 inches (100 mm) or less than 1 inch (25 mm) at any place.

**160-3.7 SPICING WIRE.** Wire splices in longitudinal wires will be permitted if made with an approved galvanized bolt-clamp splice or a wire splice made as follows: The end of the wires shall be carried 3 inches (75 mm) past the splice tool and wrapped around the other wire away from the tool for at least six turns in opposite directions. After the tool is removed, the space occupied by it shall be closed by pulling the ends together. The unused ends of the wires shall be cut close to make a neat, workmanlike job. Woven wire shall be spliced only at posts.

**160-3.8 INSTALLING GATES.** The gates shall be hung on gate fittings, as shown on the plans. Fittings on the gate posts shall be clamped, screwed, or bolted to prevent slipping. Gates shall be so erected as to swing in the direction indicated and shall be provided with gate stops, as specified or as shown on the plans. Gates shall be erected locations shown on the plans.

**160-3.9 EXISTING FENCE CONNECTIONS.** Wherever the new fence joins an existing fence, either at a corner or at the intersection of straight fence lines, a corner or anchor post shall be set at the junction and braced and anchored the same as herein described for corner posts.

If the connection is made at other than the corner of the new fence, the last span of the old fence shall contain a brace span.

**160-3.10 CLEANING UP.** The Contractor shall remove from the vicinity of the completed work all tools, buildings, equipment, etc., used during construction.

## METHOD OF MEASUREMENT

**160-4.1** Fences, Class A (Wood Posts) or Class B (Wood Posts), shall be measured in place from outside to outside of end posts or corner posts and shall be the length of fence actually constructed, except for the space occupied by the gates.

Driveway gates and walkway gates shall be measured in units for each gate installed and accepted.

## BASIS OF PAYMENT

**160-5.1** Payment will be made at the contract unit price per linear foot (meter) for Class A or Class B wire fence. This price shall be full compensation for furnishing all materials and for preparation, erection, and installation of these materials, and for all labor, equipment, tools and incidentals necessary to complete the item.

Payment will be made at the contract unit price per each for driveway or for walkway gates. This price shall be full compensation for furnishing all materials and for all preparation, erection, and installation of these materials and for all labor, equipment, tools, and incidentals to complete the item.

Payment will be made under:

- Item F-160-5.1 Fence, Class A--per linear foot (meter)
- Item F-160-5.2 Fence, Class B--per linear foot (meter)
- Item F-160-5.3 Driveway Gates--per each
- Item F-160-5.4 Walkway Gates--per each

### MATERIAL REQUIREMENTS

*ASTM A 121 Standard Specification for Zinc Coated (Galvanized) Steel Barbed Wire*

Fed. Spec. RR-F-191/Gen Fencing, Wire and Post, Metal

AWPA

**END OF ITEM F-160**

## ITEM F-161 WIRE FENCE WITH STEEL POSTS (Classes C and D Fences)

### DESCRIPTION

**161-1.1** This item covers the requirements for furnishing materials and constructing new wire fences and gates with steel posts in accordance with the details included herein and as shown on the plans. The class of fence to be erected shall be either Class C, woven wire fencing surmounted by two strands of barbed wire, or Class D, four strands of barbed wire, as indicated on the plans and in the bid proposal.

### MATERIALS

#### 161-2.1 WIRE.

**a. Woven Wire (Zinc-coated).** The woven wire fencing shall be 7-bar, 26-inch (66 cm) field fence with top and bottom wires No. 10 ASW gauge, and filler and stay wires No. 12 1/2 ASW gauge. Stay wires shall be spaced 6 inches (150 mm) apart. All wire shall be smooth galvanized steel wire conforming to *ASTM A 121*, Type B. All wires shall be two-dip and spaced as shown on the plans.

**b. Barbed Wire (Zinc-coated).** Zinc-coated barbed wire shall be 2-strand twisted No. 12 1/2 ASW gauge galvanized steel wire with 4-point barbs of No. 14 ASW gauge galvanized steel wire. All wire shall conform to *ASTM A 121*, Type A. The barbs shall be spaced approximately 4 inches (100 mm) apart.

**c. Barbed Wire (Copper-covered).** Copper-covered steel barbed wire shall conform to *ASTM A 121*, Type A.

**d. Barbed Wire (Aluminum-coated).** Aluminum-coated steel barbed wire shall be 2-strand twisted No. 12 1/2 ASW gauge. The 4-point barbs of No. 14 ASW gauge aluminum-coated steel wire shall be spaced approximately 5 inches (125 mm) apart. The steel wire shall have a tensile strength of between 60,000 and 80,000 pounds per square inch (413 400 and 551 200 kPa) and the aluminum coating shall have a minimum weight of .30 ounce per square foot (0.07 kilogram per square meters) of wire surface on the No. 12 1/2 ASW gauge line wire and .25 ounce per square foot (0.06 kg/square meter) of wire surface on the No. 14 ASW gauge barbs.

**e. Bracing Wire (Zinc-coated).** Wire used for cable for bracing shall be No. 9 smooth galvanized soft wire.

**161-2.2 FENCE POSTS, GATES, RAILS, BRACES, AND ACCESSORIES.** These items, when specified, shall conform to the requirements of Fed. Spec. RR-F-191 and shall be zinc-coated.

**161-2.3 CONCRETE.** Concrete shall be of a commercial grade with a minimum 28-day compressive strength of 2500 psi.

### CONSTRUCTION METHODS

**161-3.1 GENERAL.** The fence shall be constructed in accordance with the details on the plans and as specified herein using new materials, and all work shall be performed in a workmanlike manner satisfactory to the Engineer. Prior to the beginning of the work or upon the request of the Contractor, the Engineer shall locate the position of the work by establishing and marking the property line or fence line. When directed, the Contractor shall span the opening below the fence with barbed wire fastened to stakes of the required length at locations of small natural or drainage ditches where it is not practical to conform the fence to the general contour of the ground surface. The new fence shall be permanently tied to the terminals of existing fences whenever required by the Engineer. The finished

fence shall be plumb, taut, true to line and ground contour, and complete in every detail. When directed, the Contractor shall stake down the woven wire fence at several points between posts.

When directed, in order to keep stock on adjoining property enclosed at all times, the Contractor shall arrange the work so that construction of the new fence will immediately follow the removal of existing fences. The length of unfenced section at any time shall not exceed 300 feet (90 m) or such length that the stock can be kept in the proper field. The work shall progress in this manner and at the close of the working day the newly constructed fence shall be tied to the existing fence. Any openings in the fence shall be guarded when stock is using the adjoining property.

**161-3.2 CLEARING FENCE LINE.** The site of the fence shall be sufficiently cleared of obstructions, and surface irregularities shall be graded so that the fence will conform to the general contour of the ground. The fence line shall be cleared to a minimum width of 2 feet (60 cm) on each side of the centerline of the fence. This clearing shall consist of the removal of all stumps, brush, rocks, trees, or other obstructions which will interfere with proper construction of the fence. Stumps within the cleared area of the fence shall be placed a uniform distance above ground, as specified in the plans. When shown on the plans or as directed by the Engineer, the existing fences which coincide with, or are in a position to interfere with, the new fence location shall be removed by the Contractor as a part of the construction work unless such removal is listed as a separate item in the bid schedule. All holes remaining after post and stump removal shall be refilled with suitable soil, gravel, or other material acceptable to the Engineer and shall be compacted properly with tampers.

The work shall include the handling and disposal of all material cleared, excavated or removed, regardless of the type, character, composition, or condition of such material encountered.

**161-3.3 INSTALLING POSTS.** All posts shall be spaced as shown on the plans. Corner, brace, anchor, end, and gate posts shall be set in concrete bases as shown on the plans. The top of the base shall be slightly above the ground surface, trowel finished, and sloped to drain. Holes of full depth and size for the concrete bases for posts shall be provided even if blasting of rock or other obstructions is necessary. All line posts may be either driven or set in dug holes to a penetration of 3 feet (90 cm). All post setting shall be done carefully and to true alignment. Dirt removed for placing posts, anchor bars, flanges, etc., shall be replaced, tamped, and leveled. When posts are driven, care shall be exercised to prevent marring or buckling of the posts. Damaged posts shall be replaced at the Contractor's expense. No extra compensation will be made for rock excavation. Rock excavation shall not be grounds for extension of time.

**161-3.4 BRACING.** All corner, anchor, end, and gate posts shall be braced as shown on the plans. Anchor posts shall be set at approximately 500-foot (150 meters) intervals and braced to the adjacent posts.

**161-3.5 INSTALLING WIRE.** All barbed wire and woven wire shall be placed on the side of the post away from the airport, or as directed, at the height indicated on the plans. The woven wire shall be carefully stretched and hung without sag and with true alignment. Care shall be taken not to stretch the wire so tightly that it will break in cold weather or pull up corner and brace posts. All horizontal wires shall be fastened securely to each post by fasteners or clips designed for use with the posts furnished. The woven wire shall be wrapped around end, corner, and gate posts, and the ends of all horizontal wires shall be tied with snug, tight twists. The wire shall be secured to prevent slipping up and down the post. Barbed wire strands shall be stretched and each strand secured to each post to prevent slipping out of line or becoming loose. At end, corner, and gate posts the barbed wire shall be securely wrapped and anchored once about the post from outside and secured against slipping by tying the ends with snug, tight twists. However, on spans of less than 100 feet (30 m) both ends of the span need not be wrapped around the posts. The bottom wire of the woven wire fencing shall clear the ground by not more than 4 inches (100 mm) or less than 1 inch (25 mm) at any place.

**161-3.6 SPICING WIRE.** Splices in barbed and woven wire will be permitted if made with an approved galvanized bolt-clamp splice or a wire splice made as follows: The ends of each wire shall be carried 3 inches (75 mm) past the splice tool and wrapped around the other wire for at least six turns in opposite directions. After the tool is removed, the space occupied by it shall be closed by pulling the ends together. The unused ends of the wire shall be cut close to make a neat, workmanlike job.

**161-3.7 INSTALLING GATES.** The gates shall be hung on gate fittings as shown on the plans. They shall be attached in such a manner that the gate cannot be lifted off the hinges. Gates shall be erected to swing in the direction indicated and shall be provided with gate stops, as specified or as shown on the plans. Gates shall be erected at locations shown on the plans.

**161-3.8 EXISTING FENCE CONNECTIONS.** Wherever the new fence joins an existing fence, either at a corner or at the intersection of straight fence lines, a corner or anchor post shall be set at the junction and braced and anchored the same as herein described for corner posts.

If the connection is made at other than the corner of the new fence, the last span of the old fence shall contain a brace span.

**161-3.9 CLEANING UP.** The Contractor shall remove from the vicinity of the completed work all tools, buildings, equipment, etc., used during construction.

## METHOD OF MEASUREMENT

**161-4.1** Fences, Class C (Steel Posts), or Class D (Steel Posts), shall be measured in place from outside to outside of end posts or corner posts and shall be the length of fence actually constructed, except for the space occupied by the gates.

Driveway gates and walkway gates shall be measured in units for each gate installed and accepted.

## BASIS OF PAYMENT

**161-5.1** Payment shall be made at the contract unit price per linear foot (meter) for Class C or Class D wire fence. This price shall be full compensation for furnishing all materials and for all preparation, erection, and installation of these materials, and for all labor, equipment, tools, and incidentals necessary to complete the item.

Payment will be made at the contract unit price per each for driveway or for walkway gates. This price shall be full compensation for furnishing all materials and for all preparation, erection, and installation of these materials, and for all labor, equipment, tools, and incidentals necessary to complete the item.

Payment will be made under:

- Item F-161-5.1 Fence, Class C--per linear foot (meter)
- Item F-161-5.2 Fence, Class D--per linear foot (meter)
- Item F-161-5.3 Driveway Gates--per each
- Item F-161-5.4 Walkway Gates--per each

## MATERIAL REQUIREMENTS

*ASTM A 121 Standard Specification for Zinc Coated (Galvanized) Steel Barbed Wire*

Fed.Spec. Fencing, Wire, and Post, Metal  
RR-F-191/Gen

END OF ITEM F-161

## ITEM F-163 WILDLIFE DETERRENT FENCE

### DESCRIPTION

**163-1.1** This item shall consist of furnishing and installing chain-link fence fabric underground along an existing chain link fence, constructing concrete pads at existing fence gates in accordance with these specifications and the details shown on the drawings and in conformity with the lines and grades shown on the plans or established by the Engineer.

### MATERIALS

**163-2.1 CHAIN LINK FENCE FABRIC.** The fabric shall be woven with a 9-gauge galvanized steel wire in a 2-inch (50 mm) mesh and shall meet the requirements of ASTM A 392, Class II. The fabric shall be 5'-0" wide.

**163-2.2 BARBED WIRE.** Barbed wire shall be 2-strand 12-1/2 gauge zinc-coated wire with 4-point barbs and shall conform to the requirements of ASTM A 121, Class 3.

**163-2.3 WIRE TIES AND TENSION WIRES.** Wire fabric ties, wire ties, and tension wire for use in conjunction with a given type of fabric shall be of the same material identified with the fabric type. The tension wire shall be 7-gauge coiled spring wire coated similarly to the respective wire fabric being used.

Wire fabric ties shall be hog rings of galvanized steel wire not less than 9-gauge.

All material shall conform to Fed. Spec. RR-F-191/4.

**163-2.4 MISCELLANEOUS FITTINGS AND HARDWARE.** Miscellaneous steel fittings and hardware for use with zinc-coated steel fabric shall be of commercial grade steel or better quality, wrought or cast as appropriate to the article, and sufficient in strength to provide a balanced design when used in conjunction with fabric posts, and wires of the quality specified herein. All steel fittings and hardware shall be protected with a zinc coating applied in conformance with ASTM A 153.

**163-2.5 CONCRETE PADS AT GATES.** Concrete shall be of a commercial grade with a minimum 28-day compressive strength of 3000 psi.

**163-2.6 MARKING.** Each roll of fabric shall carry a tag showing the kind of base metal, kind of coating, the gage of the wire, the length of fencing in the roll, and the name of the manufacturer. Posts, wire, and other fittings shall be identified as to manufacturer, kind of base metal, and kind of coating.

**163-2.7 WEED CONTROL MATERIAL.** Shall be Krobar 1, or equal. Weed control material shall be applied at manufacturer's recommended rate, but not less than 10 pounds per acre.

### CONSTRUCTION METHODS

**163-3.1 CLEARING FENCE LINE.** All brush, stumps, logs, and other debris which would interfere with the proper construction of the fence in the required location shall be removed a minimum width of 4 feet on the side of the fence centerline before starting fencing operations. The material removed and disposed of shall not constitute a pay item and shall be considered incidental to fence construction.

**163-3.2 INSTALLING FABRIC.** Excavate ground to the depth required for proper installation of the fabric. Obtain Engineer's approval of depth of excavation before placing the wire fabric. Place the fabric and lap splice it to existing fence fabric and tie with wire ties at 2 foot 0 inch spacing. Cut wire fabric around fence post footing to allow proper placement. Backfill with native soil to original grade. Compact all backfill and fill to attain 90% of AASHTO T-180.

**163-3.3 WEED CONTROL APPLICATION.** Weed control material shall be applied over an area 3 feet wide, measured from the fence centerline, and over the wildlife fence. Apply weed control material as recommended by the manufacturer's instructions and in compliance with state and local regulations.

## METHOD OF MEASUREMENT

**163-4.1 CHAIN LINK FENCE FABRIC.** Chain-link fence fabric shall be measured for payment by the linear foot to the nearest foot. Measurement shall be along the fence from center to center of end or corner posts, excluding the length occupied by gate openings.

**163-4.2 CONCRETE PADS AT GATES.** Concrete pads at gates shall be measured by the unit.

**163-4.3 BORROW FILL MATERIAL.** Borrow material for fill will be furnished by the Port. This shall be measured by the cubic yard on the truck.

**163-4.4 WEED CONTROL APPLICATION.** Shall be measured by the linear foot.

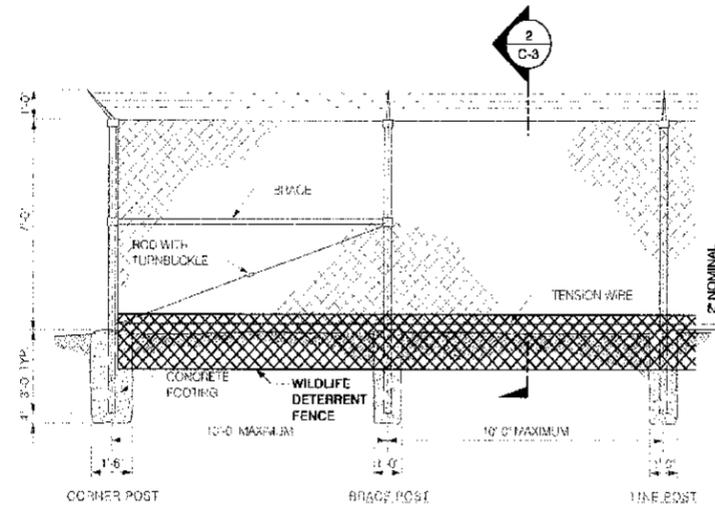
## BASIS OF PAYMENT

**163-5.1 CHAIN LINK FENCE FABRIC.** Payment for chain-link fence fabric shall be made at the contract unit price per installed linear foot. This price shall be full compensation for furnishing materials, all labor (including preparation, excavation, backfill, fill, and installation), equipment, tools, and incidentals necessary to complete this item. Utility locates shall be included in this pay item.

**163-5.2 CONCRETE PADS AT GATES.** Payment for concrete pads at gates shall be made at the contract unit price for each pad. This price shall be full compensation for furnishing materials, all labor (including preparation, excavation, backfill, placement of concrete, reinforcing steel, and forms), equipment, tools, and incidentals necessary to complete this item.

**163-5.3 BORROW FILL MATERIAL.** Payment for the loading, transporting, and placing of borrow material provided by the Port shall be made at the contract unit price. This price shall be full compensation for furnishing all labor (including placement, compaction, and grading), equipment, tools, and incidentals necessary to complete this item.

**163-5.4 WEED CONTROL APPLICATION.** Payment for weed control application shall be made at the contract unit price. This price shall be full compensation for furnishing materials, all labor, equipment, tools, and incidentals necessary to complete this item.

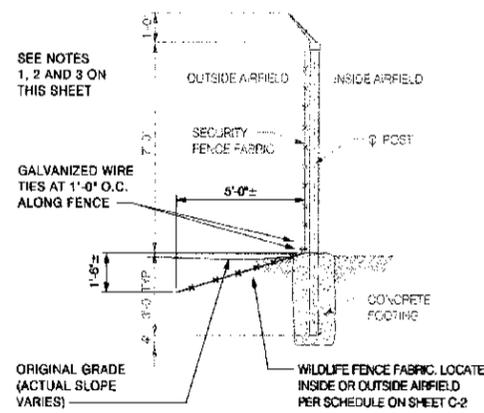


EXISTING SECURITY FENCE WITH WILDLIFE DETERRENT FENCE

ELEVATION

SCALE: 3/8"=1'-0"

1

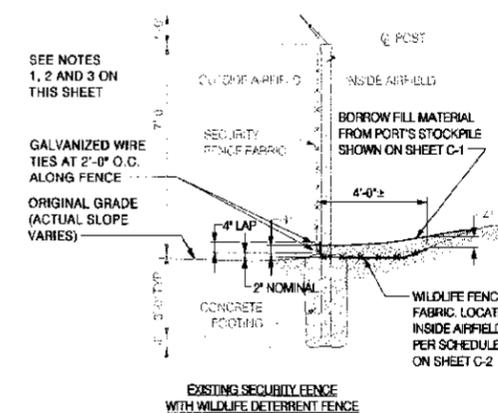


EXISTING SECURITY FENCE WITH WILDLIFE DETERRENT FENCE (TYPICAL EXCEPT AS SHOWN ON SECTION 2A/C-3)

SECTION

SCALE: 3/8"=1'-0"

2



EXISTING SECURITY FENCE WITH WILDLIFE DETERRENT FENCE

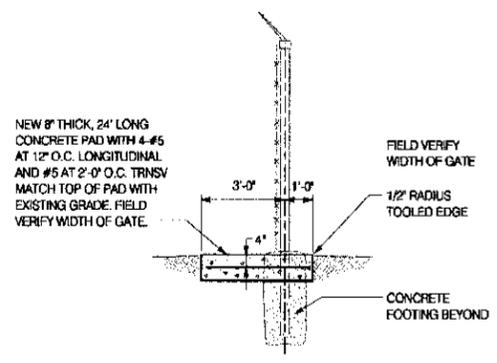
NOTE:

THIS SECTION APPLIES ONLY TO 335 LF OF FENCE BETWEEN POINTS 6 AND 7; 60 LF BETWEEN POINTS 42 AND 43; AND 100 LF BETWEEN POINTS 57 AND 58.

SECTION

SCALE: 3/8"=1'-0"

2A



CONCRETE PAD AT GATES

DETAIL

SCALE: 3/8"=1'-0"

3

- NOTES:
1. MAINTAIN SECURITY FENCE INTEGRITY AT ALL TIMES. DO NOT LEAVE EXCAVATION UNDER FENCE FABRIC WHICH WOULD PERMIT ACCESS.
  2. DEPTH OF EXCAVATION SHALL BE INSPECTED AND APPROVED BY THE ENGINEER PRIOR TO PLACEMENT OF THE CHAIN LINK FENCE FABRIC.
  3. END JOINTS BETWEEN ADJACENT SECTIONS OF WIRE FABRIC SHALL BE LAPPED 4" AND TIED WITH GALVANIZED WIRE TIES AT 2'-0" O.C. AND AT EDGES.

PORTLAND INTERNATIONAL AIRPORT

WILDLIFE DETERRENT FENCE

## MATERIAL REQUIREMENTS

ASTM A 121	Zinc-Coated (Galvanized) Steel Barbed Wire
ASTM A 123	Zinc (Hot Galvanized) Coatings on Iron and Steel Products
ASTM A 153	Zinc Coating (Hot-Dip) on Iron and Steel Hardware
ASTM A 392	Zinc-Coated Steel Chain-Link Fence Fabric
ASTM A 572	High-Strength Low-Alloy Columbium-Vanadium Structural Steel
ASTM A 1011	Steel, Sheet and Strip Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy and High-Strength Low-Alloy with Improved Formability
ASTM F 1043	Strength and Protective Coatings on Metal Industrial Chain Link Fence Framework
ASTM F 1083	Pipe, Steel, Hot-Dipped Zinc-coated (galvanized) Welded, for Fence Structures
AASHTO T-180	Moisture-Density Relations of Soils Using a 4.54-kg (10-lb) Rammer and a 457-mm (18-mm) Drop
Fed. Spec. RR-F-191/3	Fencing, Wire and Post, Metal (Chain-Link Fence Posts, Top Rails and Braces)
Fed. Spec. RR-F-191/4	Fencing, Wire and Post, Metal (Chain-Link Fence Accessories)

**END OF ITEM F-163**